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The Assistant Commissioner for Patents
BOX PATENT APPLICATION
Washington, D.C. 20231

__X__ This is a request for filing a new nonprovisional patent application.

_____ This is a request for filing a __ patent application of pending prior U.S. Application No. ___, filed _, now _.

The inventor(s) of the invention being claimed in this application is (are):

VELLORE T. VETRIVELKUMARAN AND BALAJI BALASUBRAMANYAN

The title of this application is:

AUTOMATIC CLIENT CONFIGURATION

Enclosed are:

__12__ Page(s) of Specification
__7__ Page(s) of 32 Claims
__1__ Page(s) of Abstract
__12__ Sheet(s) of Drawings
_____ Assignment of the invention to Microsoft Corporation.
_____ Assignment Cover Sheet
__X__ Declaration and Power of Attorney for Patent Application (unexecuted)
_____ Other:
_____ Priority of foreign application number ___ filed on __ in ____ is claimed under 35 U.S.C. § 119(a) - (d).
_____ The certified copy:
_____ is enclosed.
_____ was filed in prior application no. _, filed _.

EL391520324US

9/26/00

The filing fee has been calculated as shown below:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 C F R § 1 16(c))	32	-20 = 12	x $18.00 =	$ 216.00
	INDEPENDENT CLAIMS (37 C F R § 1 16(b))	6	- 3 = 3	x $78.00 =	$ 234.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 C F R § 1.16(d))			+ $270.00	$ 0.00
				BASIC FEE (37 C F R § 1 16(a))	$ 690.00
				Total of Above Calculations =	$ 1,140.00
	Reduction by 50% for filing by small entity (Note 37 C.F.R. §§ 1.9, 1.27, 1.28).				
				TOTAL =	$ 1,140.00

_____ A verified statement to establish small entity status under 37 C.F.R. §§ 1.9, 1.27:
_____ is enclosed.
_____ was filed in prior application no. _ and such status is still proper and desired (37 C.F.R. § 1.28(a)).

__X__ A check is enclosed to cover the $1,140.00 filing fee.

_____ A check is enclosed to cover the $___ petition fee under 37 C.F.R. § 1.17.

_____ A check is enclosed to cover the $ 40.00 assignment recordation fee.

_____ Charge Deposit Account No. 23-0630 in the amount of $___.

__X__ The Commissioner is hereby authorized to credit any overpayment or to charge any fees under 37 C.F.R. §§ 1.16, 1.17, 1.21 in connection with this communication to our Deposit Account No. 23-0630.

__X__ The Commissioner is hereby authorized to credit any overpayment or to charge any fees under 37 C.F.R. §§ 1.16, 1.17 which may be required during the entire pendency of this application to our Deposit Account No. 23-0630.

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Automatic Client Configuration

Field of the Invention

The present invention concerns computer networks and more particularly concerns automatic updating of computer client configurations in response to changes in the server computer configurations.

Background Art

Local area computer networks, often referred to as LANs provide a popular means of interconnecting multiple computers so that they can communicate with each other. A simple network could be used to interconnect the personal computers in a small business. It would include a small number of computers (sometimes referred to as nodes) coupled together by means of network hardware to allow the computers to share files and peripherals such as printers, modems, scanners and the like. A network of this size can be simply run as a so called peer to peer network where all computers on the network are equal at least in terms of their relationship to each other on the network.

More sophisticated local area network configurations can increase the number of computers that are connected to a network and also can require different networking software. Certain of the computer nodes on such a network have special status on the network. These so called server computers (or servers) run software for managing network communications. Often a server computer or server node will have special peripherals such as faster modems or direct Internet connections. They may also have larger, faster access memories and larger, faster hard drives than the so called client nodes on the network. One example of server software that runs a local area network's server computers is Microsoft Windows NT Server.

Server components running on a server computer offer a number of services that can change depending on how the network administrator configures the network. Server computers are typically configured in a way to meet the network administrators perceived notion of what the client nodes on the network require. In the prior art, when a server

configuration changed, the client nodes had to be changed and this was accomplished by a user accessing a configuration screen on the client and making software configuration changes for each of the client nodes on the network. Not all changes to a server software configuration need client side reconfiguration. In a small business network where relatively inexperienced administrators manage the network, it is difficult for the user to tell what updates to the server software require client nodes to be reconfigured and which of those server updates need no client reconfiguration.

More sophisticated networks have multiple servers coupled to different sets of client nodes. In a typical small business network of less than 50 computers coupled to the network there is only one server that services the needs of all client nodes. The present invention concerns efficient updating of network components including a means of updating the client software in response to a change of the status of a server computer.

Summary of the Invention

Practice of the present invention provides a user of a computer network clearly understandable information on changes to a server node in the network. In one embodiment of the invention the user must initiate changes to the client computers corresponding to the changes to the server and in other configurations the changes are automatically implemented by software running in the client computers.

An exemplary embodiment of the invention updates a client computer coupled by means of a network to a server computer. The updating process begins with a change in the status of a server computer. This change can be necessitated by addition of hardware such as an additional hard drive or the addition of an additional service such as shared Internet access. A status message is transmitted by means of the network between the server computer and the client computer regarding the changed status of the server computer. This message can be either an alert message from the server to all connected client nodes or can be achieved by a polling of the server by the client computers for updated status of the server. A message is displayed at the client computer to apprise a user that a status of the server computer has changed. Additionally, a communications between the client computer and the server computer takes place over the network to

inform the client computer regarding details of the change of status in the server computer.

In one exemplary embodiment of the invention a message is displayed on the client computer that a change has taken place in the server status and this message prompts the user to run a setup wizard that will upgrade the client computer status to correspond with the upgraded status of the server computer. An exemplary wizard performs a comparison of the client and server status and provides a checkbox control for updating the client. In an alternate embodiment the client is automatically updated to a configuration required by the updated server status and the user is merely apprised that an updated client status has been achieved.

These and other objects advantages and features of the invention will become better understood from the following detailed description of an exemplary embodiment of the invention which is described in conjunction with the accompanying drawings.

Brief Description of the Drawings

Figure 1 is a schematic of a network of computers wherein one server computer is coupled to multiple client computers;

Figure 2 is a schematic depiction of the components of a representative computing device coupled to the network shown in Figure 1;

Figure 3 is a block diagram showing client and server software components used in practice of the exemplary embodiment of the invention;

Figure 4 is a user interface that includes a link for launching a computer setup wizard;

Figure 5 is a user interface for choosing a user status during installation of networking software used in conjunction with the present invention;

Figures 6 and 7 are message conveying user interfaces for use in conjunction with the present invention;

Figures 8 – 12 are representative user interface screens that guide a user through a process of updating or reconfiguring a client computer using a computer setup wizard; and

Figures 13 – 15 schematically indicate a sequence of user interface pages displayed during a client configuration update process.

Exemplary embodiment for practicing the Invention

Turning now to the drawings, Figure 1 is a schematic depiction of a computer network 10. The network 10 is shown as having a single server computer 12 and a number of client computers 14. In the following explanation it is assumed that the network 10 is a relatively small network (less than 50 computer nodes) and is often referred to as a local area network or LAN.

The network 10 includes a plurality of computing nodes each of which includes a computing device. One of the computing devices is a server computer and a number of other computing devices are client computers. Components of an exemplary computing device 100 are shown in Figure 2. In its most basic configuration, the computing device 100 includes at least one processing unit 102 and memory 104. Depending on the exact configuration and type of computing device, the memory 104 may be volatile (such as RAM), non-volatile (such as ROM, flash memory, etc) or some combination of the two. This most basic configuration is illustrated as forming a module or component 106 of the Figure 2 computing device.

Additionally the computing device 100 may also have additional features/functionality. For example, the computing device 100 may also include additional storage (removable and/or non-removable) including, but not limited to, magnetic or optical disks or tape. Such additional storage is illustrated in Figure 1 by removable storage 108 and non-removable storage 110. The computer storage media includes volatile and non-volatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. The memory 104, removable storage 108 and non-removable storage 110 are all examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage

or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computing device 100.

In order to communicate over the network the computing device contains a communications connection 112 that allows the device 100 to communicate with other devices on the network 10 or as seen in Figure 1 would allow the server 12 to communicate with other computers over the Internet 20. The communications connection 112 includes an interface to a communications media. A communications media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communications media includes the physical layer of the hardware for carrying signals on wire media such as a wired network or wireless media such as acoustic, RF, infrared and other wireless media. Network links 113 between computing devices in the Figure 1 network depiction are implemented using some or all of the aforementioned communications media. The term computer readable media as used in the present description includes both storage media and communications media.

The computing device 100 may also have input devices(s) 114 such as a keyboard, mouse, pen, voice input device, touch input device, etc. Output devices 116 such as a display, speakers, printers, etc may also be included. All these devices are well known in the art and need not be discussed at length herein. It is noted that the server 12 in Figure 1 may be configured without a video display or keyboard input. In such a circumstance control functions and setup on the server 12 are performed by an interface to the server 12 available through one of the client computers. When the network 10 is initially set up, special server software is installed on the server computer 12 and other networking software is installed on the client computers 14. Alternatively, the server computer may be delivered from a vendor with all software installed and may only need to be configured. Such a computer is referred herein as a server appliance to be contrasted from a computer that is merely configured to act as a server due to the installation of software for performing server functions.

The server software provides a variety of features or functions that may or may not be required by a network administrator responsible for maintaining the network 10. As an example, when the network is first installed, Internet access may not be made available to the client computers by means of the network 10. As the user's needs and sophistication grow the server software can be reconfigured to provide additional network functionality.

The present invention provides a means of updating a client computer 14 in the event the server 12 is reconfigured. The process is initiated in response to a user, typically the network administrator changing a status or reconfiguring the server computer 12. When a reconfiguration takes place a status message is sent by means of the network between the server computer and the client computer regarding the change of status of the server computer 12. A message is displayed at the client computer on a display coupled to the client to apprise a user that a status of the server computer has changed. Further communications between the client computer 14 and the server computer 12 takes place over the network 10 to inform the client computer 14 regarding details of the change of status in the server computer 12. In the exemplary embodiment of the invention the client and server are running a Windows ® operating system developed by Microsoft Corporation.

The exemplary embodiment of the invention is implemented using three software components shown in Figure 3: an alerting layer 150, an NT Service 152 and a client side Win32 wizard 154. The alerting layer provides a uniform mechanism for the NT Service 152 to indicate if a server state change or reconfiguration requires a client computer reconfiguration. The NT service 152 also provides a mechanism by which the client can query the server for specific state changes and the client side wizard 154 provides the user with a easy to use interface for updating the client configuration to match the server that has been reconfigured.

Alerting Layer:

A back end framework component 156 on the server provides a mechanism to alert the user to abnormal conditions in the system. These conditions are reflected in an administration web page (Figure 7) that a user sees when viewing the server settings from

a browser running on a remote client computer 14. The invention provides a layer on top of this back end framework 156, the Alerting Layer 150, that is used by the individual services to inform a user that a change of state has occurred on the server 12 that requires the client computers on the network 10 to be reconfigured. The Alerting Layer 150 guarantees that only one such alert is displayed to the network clients at all times (this means that if more than one service needs the client to be reconfigured, the user on the client will still see only one message about the need to reconfigure the client).

A user pointing a browser at the server sees this generic message and can respond by launching a client side wizard 154 to configure that client appropriately. This wizard 154 is run on each client in the network in order to get the clients on the network in sync with the server settings.

NT Service

The NT Service 152 is responsible for telling the client what are the exact changes that have occurred to the server. Note that the message sent to the client discussed above is generic and only tells the user that something has changed on the server. The NT service also responds to client requests to tell the client exactly what has changed on the server 12.

This NT Service is a DCOM server with security settings allowing everyone to access it from any client computer 14 having a DCOM client interface software component. This allows any client on the network to talk to this NT service 152 and find out the state of the server. Note that since this service provides a read only interface to the server, it is not a breach of security to allow anyone on the network to talk to this DCOM server component.

Client Side Wizard:

The client side wizard 154 is a software component running on the client and provides an easy to use user interface on the client to efficiently allow the user to understand what settings need to be updated on the client computer 14. This wizard 154 gets the current server settings from the DCOM server (NT service mentioned above), compares the server settings thus obtained with the current client settings and then

presents the user with a change list which indicates which of the services on the client need to be reconfigured. The user has the option to override the changes suggested by the client at this point. Once the user has decided on the options, this wizard 154 takes care of actually updating the client to work with the server.

Software Installation

Each of the client and server computers shown in Figure 1 is a computing device similar to the computing device 100 described above in relation to Figure 2. The network server 12 comes from a supplier with software already installed in a default configuration. In the event this is a server appliance for managing the network, there is no video display nor is there a keyboard or mouse input and the means of re-configuring the server.

Networking software for the client computers 14 is installed in accordance with an installation process performed by installation software read from a storage medium such as a floppy disk or CDROM. A network interface card is installed and set up in accordance with a software installer component shipped with the interface card by the interface card supplier. A network setup wizard performs steps of detecting a working network card, then setting up needed networking components (such as TCP/IP or other protocols) and possibly rebooting the computer. The networking wizard installs and registers client side components, may upgrade the computer browser softare, and may install DCOM components. During the installation process a user interface 180 that is depicted in Figure 5 prompts the user to input a choice of managing the network computing device 100 as either an administrator or a user.

For non-administrator users, a computer setup wizard prompts the user on how to set up shared disk files with the server over the network. Other prompts from the setup wizard help users install a printer, achieve a shared Internet connection and enable security if the server is currently configured to offer such services.

Server Reconfiguration

The same comupter setup wizard that guides the user during the installation process helps the user respond to reconfiguration messages sent by the server 12 due to

server reconfiguration performed as server services are updated or changed by a network administrator. Subsequent to a server reconfiguration, the next time a client computer points to the server in a browser address window, an information message will be displayed in a message list on a user interface status tab 200. The alerting layer 150 will raise an alert to inform the user that configuration changes to the server necessitate a change to the configuration of the client computers. In an alternative embodiment of the invention the alert is broadcast to all client computers 14 coupled to the network 10 and a popup message will be displayed to cause the client user to be aware that the client has been reconfigured.

Figures 6 and 7 are before and after pages 202, 204 displayed by the browser showing the format of the information message sent to the client computers by the server 12, to prompt the user in re-configuring a client computer 14. In the example depicted in Figure 7, the server has raised an alert that informs a user that the server configuration has changed. The message presented to the user is generic and when the user sees the information shown in Figure 7, he or she has no way to know that the change has been caused by an addition of a printer. That information is revealed when the user clicks on a "Change setup of all computers" link 207. Each client computer will receive a similar message asking that the user reconfigure the client software to match the reconfigured server. The users will be able to configure the client components by clicking on the link 207. Clicking on the link 207 launches a descriptive page 210 (Figure 4) which allows the user to launch the computer set up wizard by clicking a link 212. The page 210 also contains instructions for launching the set-up wizard at other user computers on the network 10. In a Windows ® environment the user may alternatively reconfigure the client computer by running the computer setup wizard by pointing to the "Start" menu and clicking on an appropriate menu item. The computer set up wizard is loaded and executed to prompt a user on how to reconfigure the network settings on the client computers attached to the network.

Figure 7 depicts a specific instance of a client computer receiving a generic alert message. Alerts are also sent to the clients when a printer is removed from the network, an internet connection is configured, security is enabled, or security is disabled. Each computer display will receive a message indicating that the network setup has changed

and the user must make corresponding client computer changes include those clients that have been assigned server configuration privileges.

Figure 8 is a first interface page 220 presented to the user when the computer setup wizard is launched. A 'next' button 222 is activated to move to the second interface page 224 depicted in Figure 9. This interface includes a text window or memo box 226 showing a list 228 of possible set up changes the user is requested to approve. The list includes four check boxes that have been selected or unselected depending upon the sensed condition of the reconfigured server computer 12. By clicking on a next button 230 the user can accept the recommended settings based upon communications between the client computer 14 that is being reconfigured and the setting of the server that were communicated to the client from the server in response to a request for such information.

Three additional user interface pages 240, 242, 244 are displayed to the user by the computer setup wizard and are depicted in Figures 10 - 12. The first page 240 gives the user an opportunity to confirm that he or she wishes to reconfigure the client computer. The next page 242 allows the user to monitor progress of the client reconfiguration and a page 244 displays a message that the reconfiguration was successful. If it was not successful a different message with instruction on how to attempt a reconfiguration is presented on the client computer display.

Figures 13 – 15 schematically depict other pages intermediate the setup changes page 224 and the ready to setup page 240 that are displayed by the computer setup wizard. The depiction of Figure 13 illustrates additional user interface pages 250, 252, 254, 256 needed to guide a user through an installation of a printer that has been added to the network server 12. In a printer driver page 250 options regarding a printer driver for a new printer are made available for selection by a user. If a driver is installed the user will be prompted to allow a reboot of the computer.

Figure 14 is a depiction of a page 260 displayed by the wizard to depict a network security feature to password protect access to server resources from the client computers 14. A client setup change that configures the client to use a server appliance user account has one component setup page 260. The user is prompted for a user name in order to enable the server to determine if a user account exists for that user before installing a security component in the client computer 14.

Figure 15 illustrates a setup page 262 for enabling sharing of a hard disk on the server by the client computer 14. The page 262 presents a user options for mapping a shared disk drive available from the server computer 12 onto the client computer 14. The shared drive is mapped as a designated drive on the client 14 and an option is made available to the user to added a shortcut to the drive that has been shared on the client desktop.

Internet access example

Consider an example of a small business network 10 having a server 12 on which internet sharing has just been enabled by a user having administrator privileges. When internet sharing is enabled on the server, Winsock proxy client side bits must be installed on each client computer 14. Since the Windows operating system on the server involves enabling both the Winsock proxy and the web proxy on the server, this step also requires a configuring of the server 12 to be the web proxy for the browser on the client computer 14.

The steps of reconfiguring to achieve shared Internet access are outlined below. First an administrator user must enable internet sharing on the server 12. To do this the user runs an Internet Configuration Wizard on a browser running on a remote client computer 14. This causes the Internet sharing service on the server 12 to enable itself. The Internet Sharing service on the server in turn enables the web proxy and the Winsock proxy on the server. An Internet sharing service on the server 12 then uses the alerting layer 150 to raise an alert telling the clients on the network 10 that they need to reconfigure themselves. The backend framework 156 takes this information and shows it as an alert message on the server management page of any client computers having administrator status. Normal users on other clients see this as an alert message on the status page of their browser, allowing the user to run the client side computer setup wizard 185. This wizard contacts the DCOM server 152 on the server 12 to find out which services are enabled/disabled on the server 12. The server returns this list to the client 14. The wizard then checks the state of the client. From this comparison it is determined that Internet Sharing is enabled on the server but not on the client. This is brought to the Users attention by adding a check mark to the check box 232 depicted in

the user interface page 224 shown in Figure 9. If the user allows this change by clicking on the next box 230, the wizard 185 configures the client to use Winsock proxy client and sets the web proxy for the browser on the client to be the server 12.

The examples discussed have all depended on a user launching a computer setup wizard but it is certainly possible that software modifications could be made using the DCOM components in the server and clients to automatically reconfigure the clients. Such an option could prompt the user when the update occurs that such an update has occurred or could prompt the user to confirm that such an update is desired. As an alternative, the client computer 14 could be configured to poll the server computer 14 for any updates in status each time the client is rebooted or each time a user signs onto the client.

While the disclosed exemplary embodiment of the invention has been described with a degree of particularity, it is the intent that the invention include all alterations and modifications from the disclosed design falling within the spirit or scope of the appended claims.

Docket: 144211.1

What is Claimed:

1. A method for updating a client computer coupled by means of a network to a server computer comprising:

a) changing a status of a server computer;

b) transmitting a status message by means of the network between the server computer and the client computer regarding a change of status of the server computer;

b) displaying a message at the client computer to apprise a user that a status of the server computer has changed; and

c) initiating a communications between the client computer and the server computer over the network to inform the client computer regarding details of the change of status in the server computer.

2. The method of claim 1 additionally comprising the changing of server computer status by means of software running on a client computer coupled to the server computer by means of the network.

3. The method of claim 1 wherein the step of transmitting a status message is performed in response to periodic polling of the server status by the client computer.

4. The method of claim 1 wherein the step of transmitting a status message is performed by the server computer sending an alert message to the client computer regarding the change of server status.

5. The method of claim 4 wherein there are a plurality of client computers coupled to the server computer by means of the network and wherein the server computer broadcasts an updated server status to each of the client computers.

6. The method of claim 1 wherein the details in the change in status of the server computer includes a list of updated server computer status features and additionally

comprising the step of displaying said list of updated server computer status features and a then current status of said features for the client computer to aid a user in updating the client computer status.

7. The method of claim 1 wherein the server computer includes a client interface component for allowing the client computer read only access to a status of the server computer while determining a change of status of the server computer.

8. The method of claim 1 additionally comprising automatically reconfiguring the client computer based on the details of the change of status in the server computer.

9. The method of claim 8 additionally comprising displaying a message at the client computer that a status of the client computer has automatically been reconfigured based on the change of status of the server computer.

10. A method for updating a client computer coupled by means of a network to a server appliance comprising:

a) presenting a status message in response to a change in status of the server appliance by means of the network interface of the server appliance to alert one or more client computers connected to the network that there has been a change of status of the server appliance; and

b) responding to a receipt of the status update request message from the one or more clients by sending a network message to a client computer to apprise a client computer regarding a change of status of the server appliance by exposing an upgraded status of the server appliance to said client computer to inform the client computer regarding details of the change of status in the server appliance.

11. The method of claim 10 additionally comprising the step of initiating the change of the status of the server appliance in response to a a request from an administrator having

administrator status on a client computer coupled to the server appliance by means of the network.

12. The method of claim 10 wherein the client computer responds to the communications between the client computer and the server appliance by a step of displaying a user interface that allows the user to selectively update the client to match a changed status of the server appliance.

13. The method of claim 12 wherein the client computer obtains an updated server appliance status and displays an updated server appliance status and a then current status of the client computer to aid a user in updating the client computer status.

14. The method of claim 10 wherein the server appliance includes a client interface component for allowing the client computer read only access to the server appliance to determine a nature of a changed status of the server appliance.

15. Apparatus for updating one or more client computers coupled to a computer network comprising a server computer having a processor for executing a stored program within a computer server memory said stored program comprising:

a) a status update component to allow a user to change a status of a server computer coupled to a network;

b) a communications component for transmitting a status message by means of the network to one or more client computers regarding the change of status of the server computer to apprise a user that a status of the server computer has changed; and

c) a read only status component for exposing a detailed listing of the status of said server computer corresponding to an updated status of the server computer following the change of status of said server computer.

16. The apparatus of claim 15 wherein the communications component is a DCOM server component having an interface exposed to a DCOM client residing on the one or more client computers.

17. A computer readable medium for storing computer instructions for updating a client computer coupled by means of a network to a server computer comprising instructions for performing the steps of:

a) changing a status of a server computer;

b) transmitting a status message by means of the network between the server computer and the client computer regarding a change of status of the server computer;

b) displaying a message at the client computer to apprise a user that a status of the server computer has changed; and

c) initiating a communications between the client computer and the server computer over the network to inform the client computer regarding details of the change of status in the server computer.

18 The computer readable medium of claim 17 additionally comprising instructions for changing of server computer status by means of software running on a client computer coupled to the server computer by means of the network.

19. The computer readable medium of claim 17 additionally comprising insturctions for periodic polling of the server status by the client computer.

20. The computer readable medium of claim 17 additionally comprising instructions to display the details in the change in status of the server computer including a list of updated server computer status features and additionally comprising the step of displaying a user actuatable control to allow an user to update one or more corresponding client computer features based on the list of updated server computer status features.

21. The computer readable medium of claim 17 additionally comprising instructions for automatically reconfiguring the client computer based on the details of the change of status in the server computer.

22. The computer readable medium of claim 21 additionally comprising insstructions for displaying a message at the client computer that a status of the client computer has automatically been reconfigured based on the change of status of the server computer.

23. Computer readable medium containing computer executable instructions for updating a client computer coupled by means of a network to a server appliance comprising instructions for performing the steps of:

a) presenting a status message in response to a change in status of the server appliance by means of the network interface of the server appliance to alert one or more client computers connected to the network that there has been a change of status of the server appliance; and

b) responding to a receipt of the status update request message from the one or more clients by sending a network message to a client computer to apprise a client computer regarding a change of status of the server appliance by exposing an upgraded status of the server appliance to said client computer to inform the client computer regarding details of the change of status in the server appliance.

24. The computer readable medium of claim 23 additionally including instructions for initiating the change of the status of the server appliance in response to a a request from an administrator having administrator status on a client computer coupled to the server appliance by means of the network.

25. The computer readable medium of claim 23 additionally including instructions for implementing a client interface component for allowing the client computer read only access to the server appliance to determine a nature of a changed status of the server appliance.

26. For use with a computer having a graphical user interface including a display and a user interface selection device, a method of updating a configuration of the computer in response to a reconfiguration of a network server by means of computer setup wizard which comprises the steps of:

a) displaying an interface link that can be actuated with an interface selection device to launch the computer setup wizard in response to receipt of message from the network server that a server configuration has changed;

b) communicating with the server to determine an updated status of the server computer and displaying a list of client reconfiguration choices based on the updated status;

c) allowing a user to accept or modify the list of client reconfiguration choices; and

d) providing a command button which when actuated by the user begins the process of reconfiguring the client computer based upon the list of client reconfiguration choices.

27. The user interface of claim 26 wherein a list of checkboxes are presented on the display which allow the user to select desired client reconfigurations from the list of client configurations.

28. The user interface of claim 27 wherein the checkboxes have an initial state of being either checked or unchecked based on a sensed configuration of the server computer.

29. The user interface of claim 27 wherein at least one checkbox relates to a disk drive configuration on the client for sharing access to a disk drive on the network.

30. The user interface of claim 27 where at least one checkbox relates to adding shared Internet access through a server connection to the Internet by means of communications with the server over a network.

31. The user interface of claim 27 wherein at least one checkbox relates to adding secure access to services of the server from the client computer by means of network password protection.

32. The user interface of claim 27 wherein at least one checkbox relates to a printer reconfiguration on the client computer based on a presence of a printer coupled to a network.

0 5 6 5 6 5 7 4 5 2 5 6 0

Abstract

The invention includes method and apparatus for updating a configuration of a client computer coupled by means of a network to a server computer. The updating process begins with a change in the status of a server computer. This change can be necessitated by addition of hardware such as an additional hard drive or the addition of an additional service such as shared Internet access. A status message is transmitted by means of the network between the server computer and the client computer regarding the changed status of the server computer. This message can be either an alert message from the server to all connected client computer nodes or can be accomplished by client polling for an updated status of the server. A message is displayed at the client computer to apprise a user that a status of the server computer has changed. Additionally, a communications between the client computer and the server computer takes place over the network to inform the client computer regarding details of the change of status in the server computer. This updated status allows a computer setup wizard running on the client computer to upgrade the status of the client.

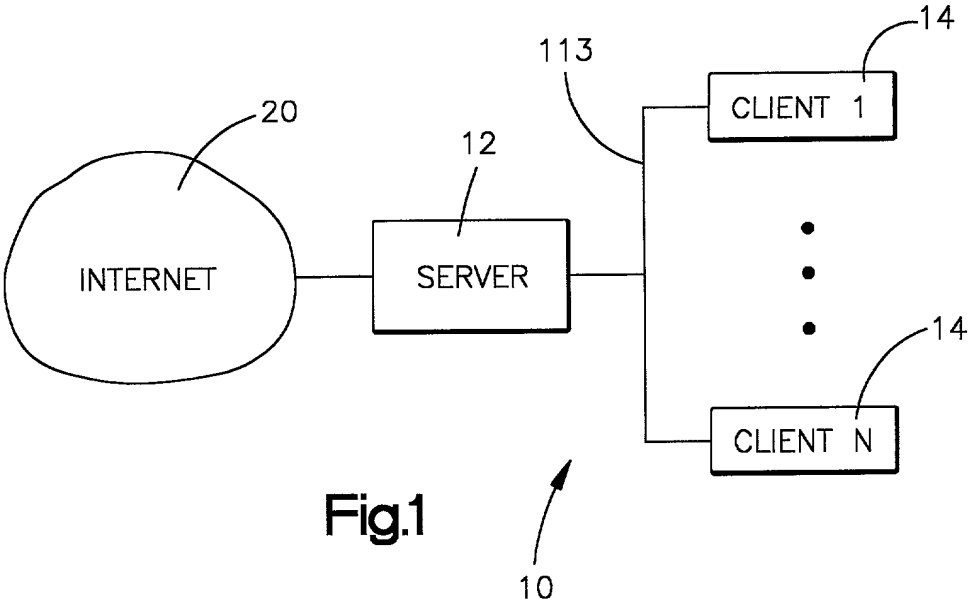

14
113
CLIENT 1
20
12
INTERNET
SERVER
14
CLIENT N
10

Fig.1

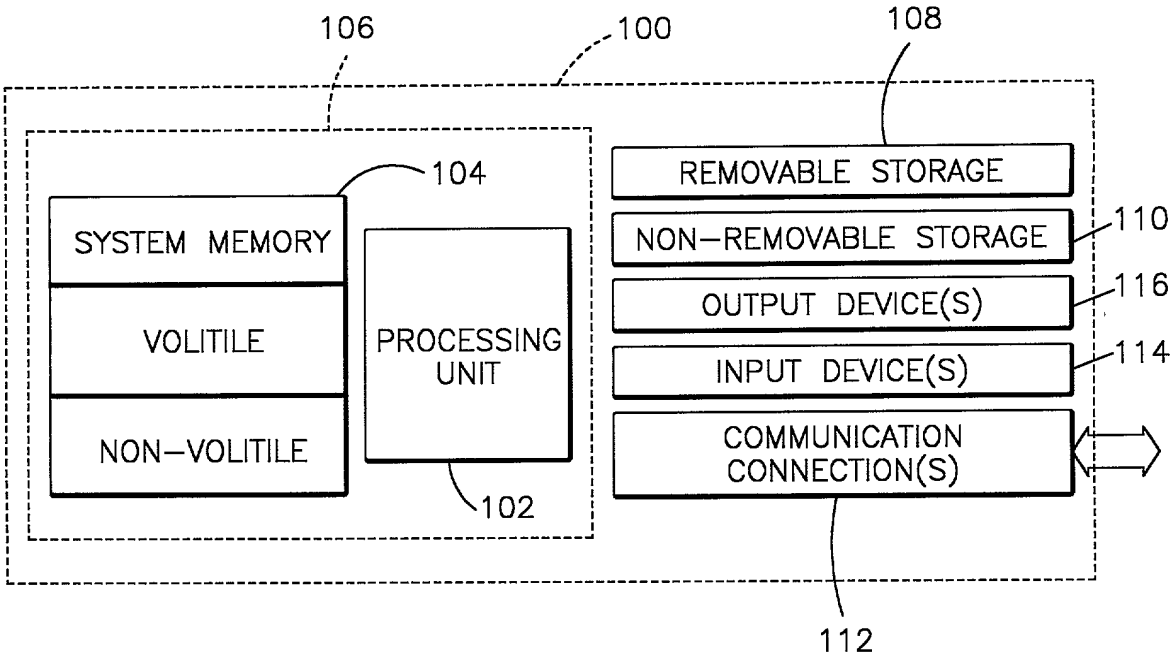

106
100
108
104
SYSTEM MEMORY
VOLITILE
NON-VOLITILE
PROCESSING UNIT
102
REMOVABLE STORAGE
NON-REMOVABLE STORAGE
110
OUTPUT DEVICE(S)
116
INPUT DEVICE(S)
114
COMMUNICATION CONNECTION(S)
112

Fig.2

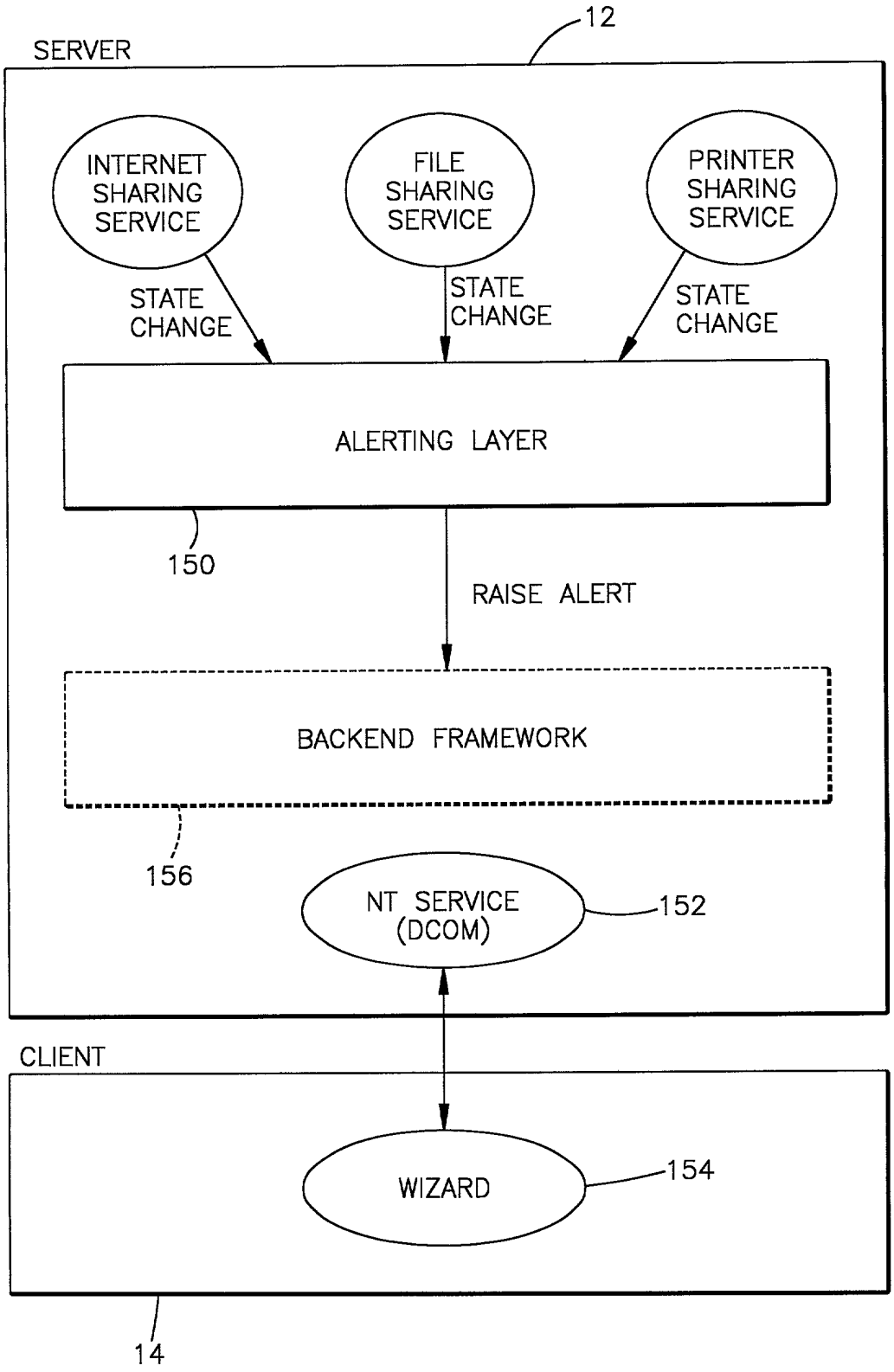

12
SERVER
INTERNET SHARING SERVICE
FILE SHARING SERVICE
PRINTER SHARING SERVICE
STATE CHANGE
STATE CHANGE
STATE CHANGE
ALERTING LAYER
150
RAISE ALERT
BACKEND FRAMEWORK
156
NT SERVICE (DCOM)
152
CLIENT
WIZARD
154
14

Fig.3

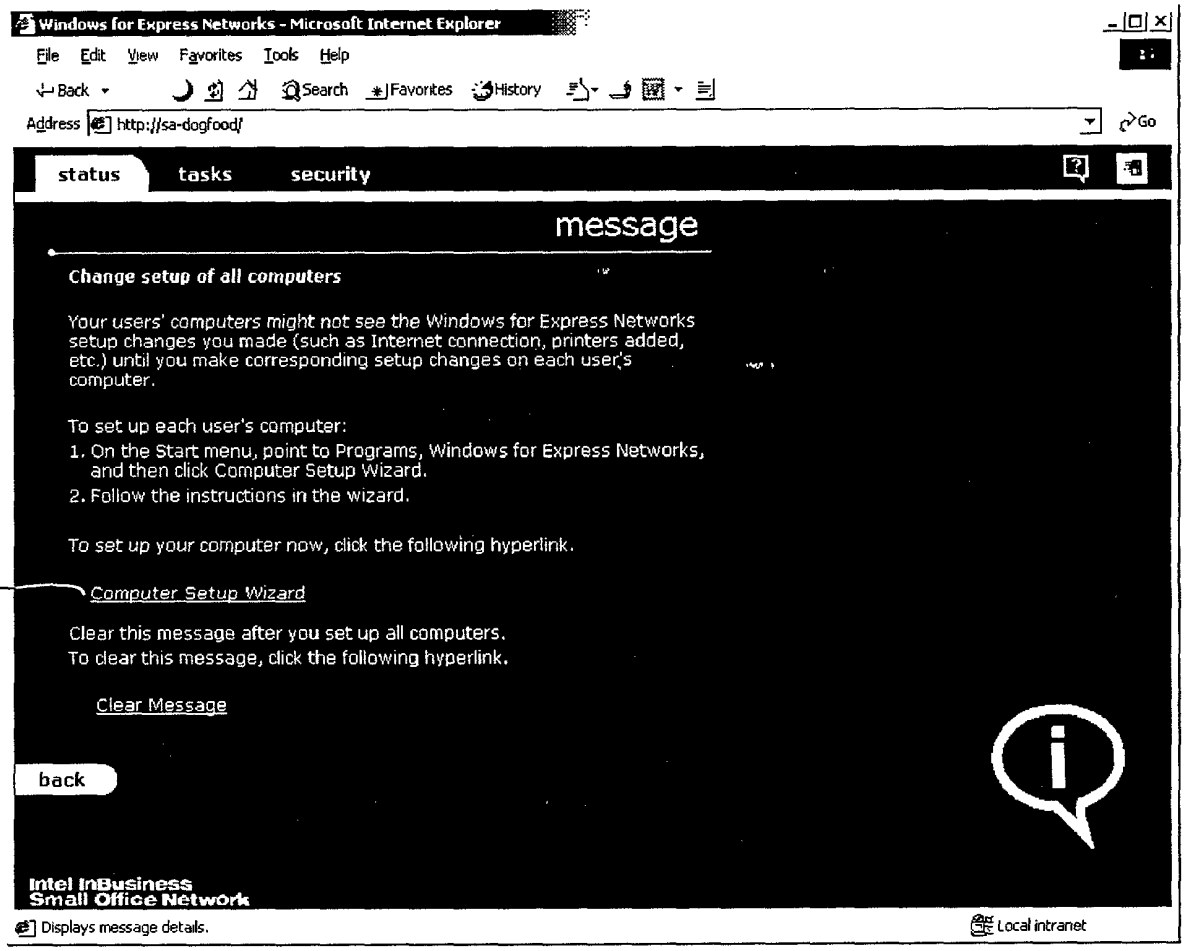

Windows for Express Networks - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://sa-dogfood/
Go
status
tasks
security
message
Change setup of all computers
Your users' computers might not see the Windows for Express Networks setup changes you made (such as Internet connection, printers added, etc.) until you make corresponding setup changes on each user's computer.
To set up each user's computer:
1. On the Start menu, point to Programs, Windows for Express Networks, and then click Computer Setup Wizard.
2. Follow the instructions in the wizard.
To set up your computer now, click the following hyperlink.
Computer Setup Wizard
Clear this message after you set up all computers.
To clear this message, click the following hyperlink.
Clear Message
back
Intel InBusiness
Small Office Network
Displays message details.
Local intranet
212
210

Fig.4

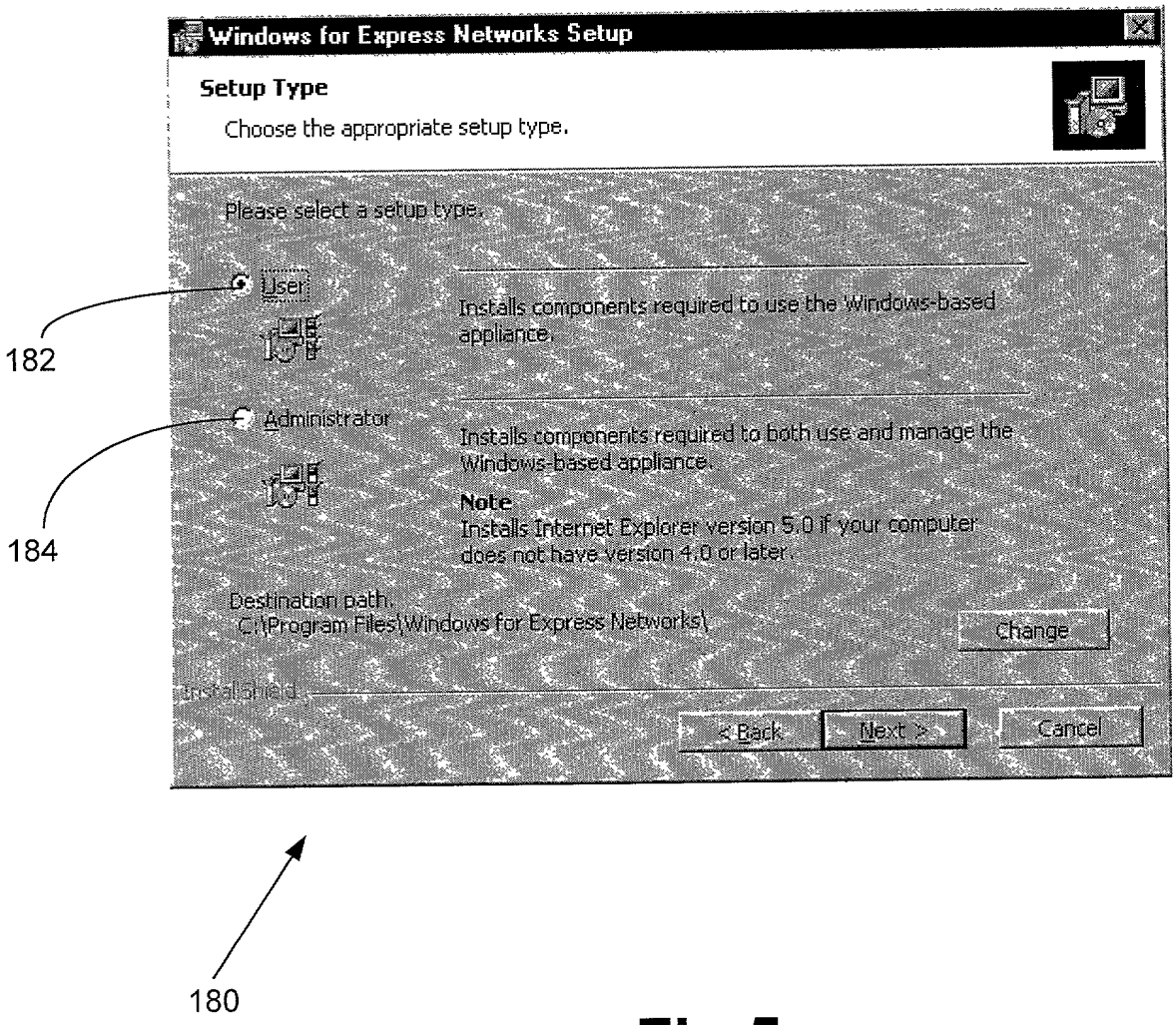

Windows for Express Networks Setup
Setup Type
Choose the appropriate setup type.
Please select a setup type.
User
Installs components required to use the Windows-based appliance.
Administrator
Installs components required to both use and manage the Windows-based appliance.
Note
Installs Internet Explorer version 5.0 if your computer does not have version 4.0 or later.
Destination path:
C:\Program Files\Windows for Express Networks\
Change
InstallShield
< Back
Next >
Cancel
182
184
180

Fig.5

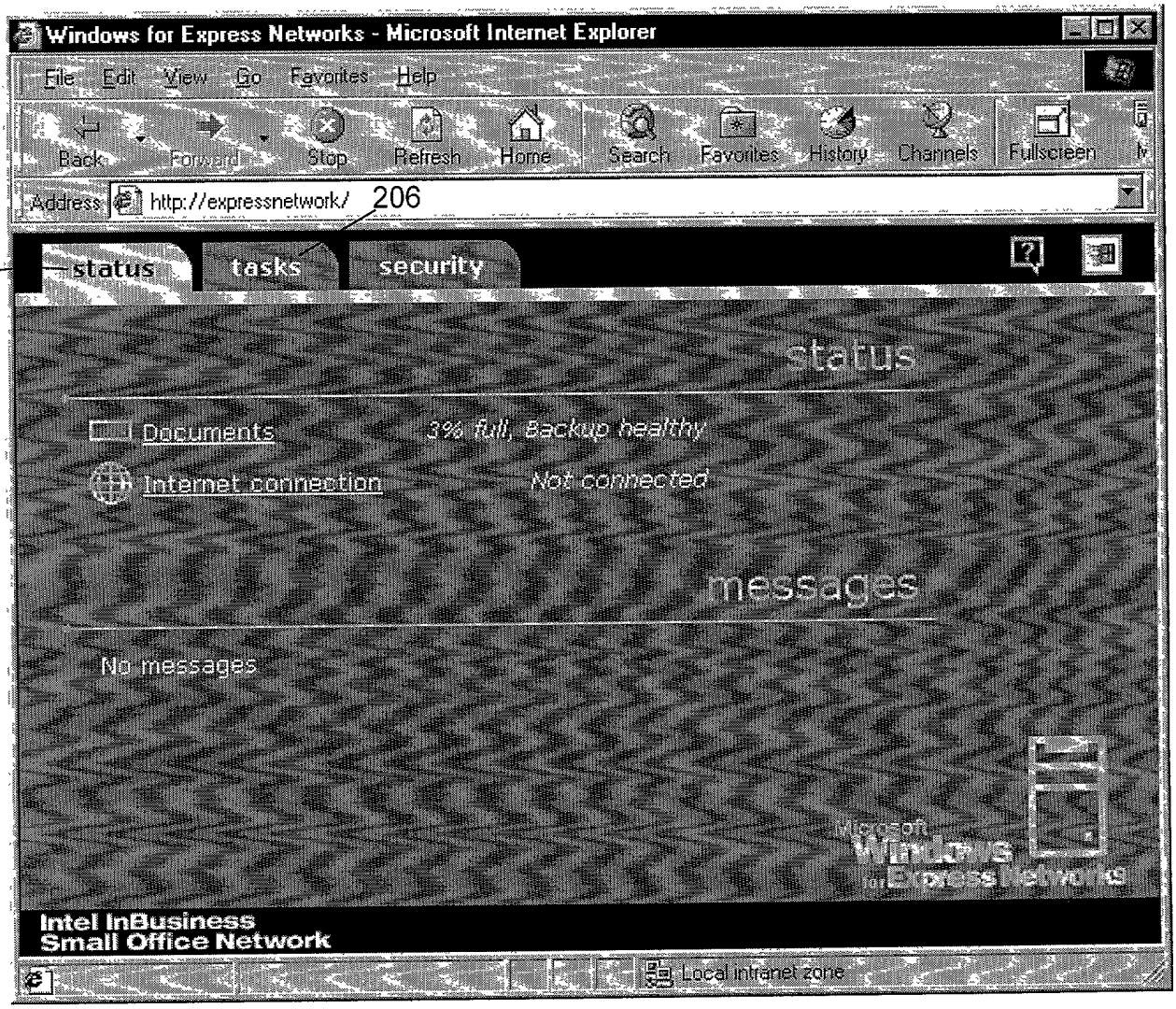

Windows for Express Networks - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen
Address http://expressnetwork/
206
status
tasks
security
200
status
Documents
3% full, Backup healthy
Internet connection
Not connected
messages
No messages
Intel InBusiness
Small Office Network
Local intranet zone
202

Fig.6

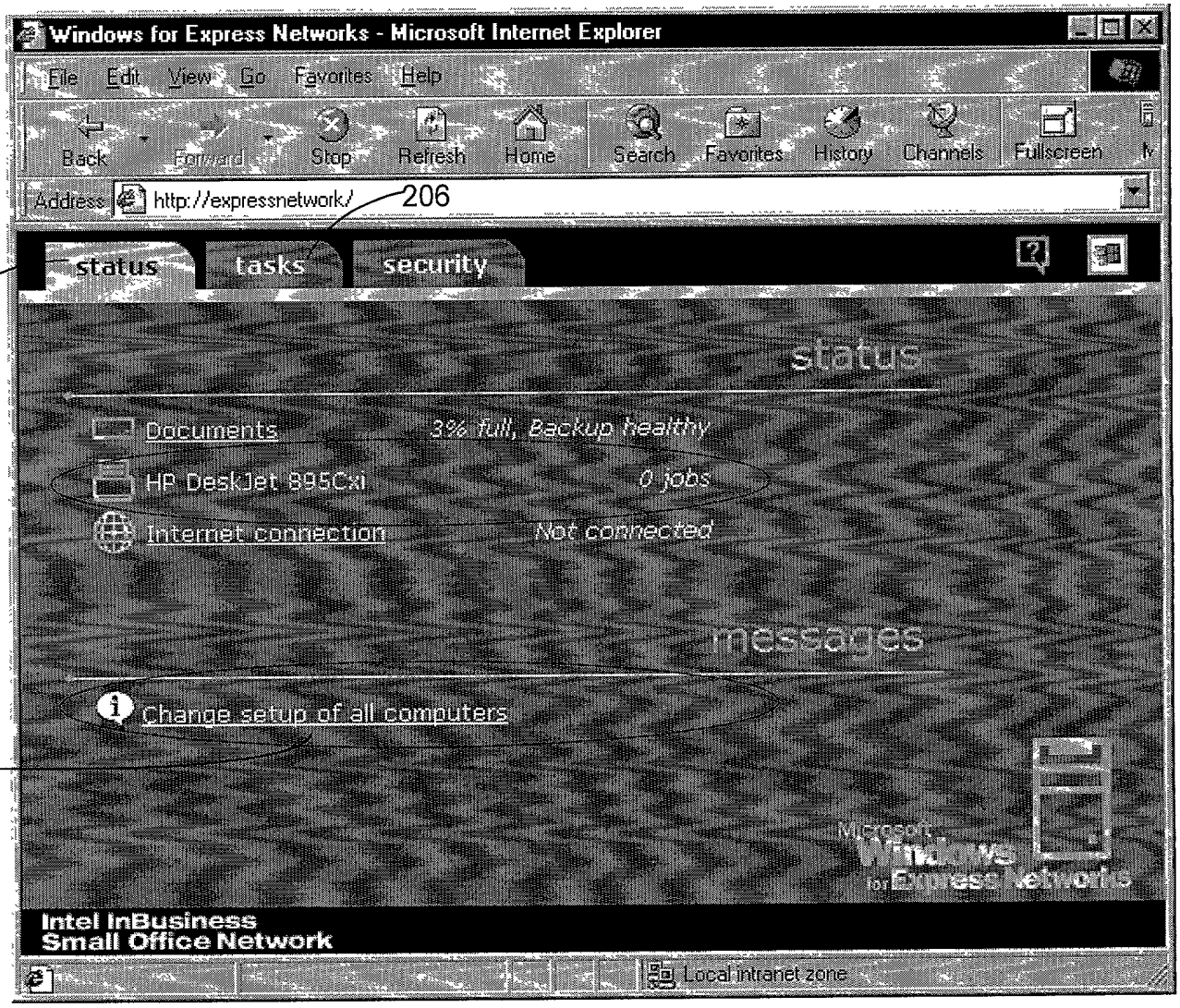

Windows for Express Networks - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen
Address http://expressnetwork/
206
status tasks security
200
status
Documents 3% full, Backup healthy
HP DeskJet 895Cxi 0 jobs
Internet connection Not connected
messages
Change setup of all computers
207
Intel InBusiness
Small Office Network
Local intranet zone
204

Fig.7

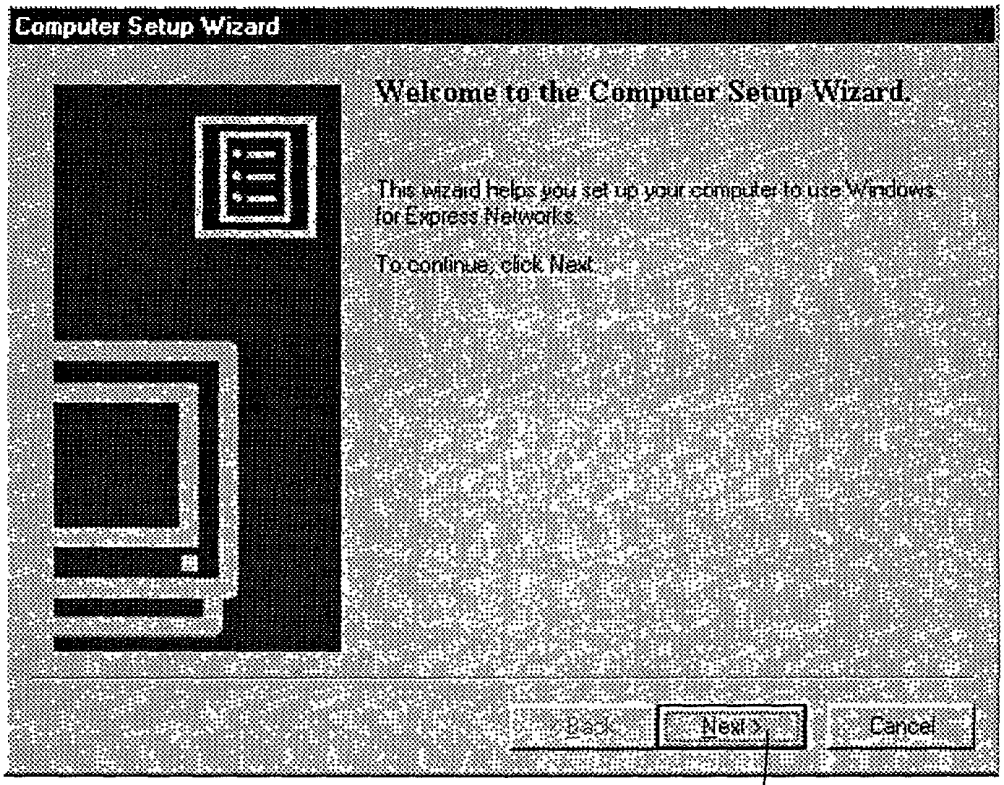

Computer Setup Wizard
Welcome to the Computer Setup Wizard.
This wizard helps you set up your computer to use Windows for Express Networks.
To continue, click Next.
< Back
Next >
Cancel
220
222

Fig.8

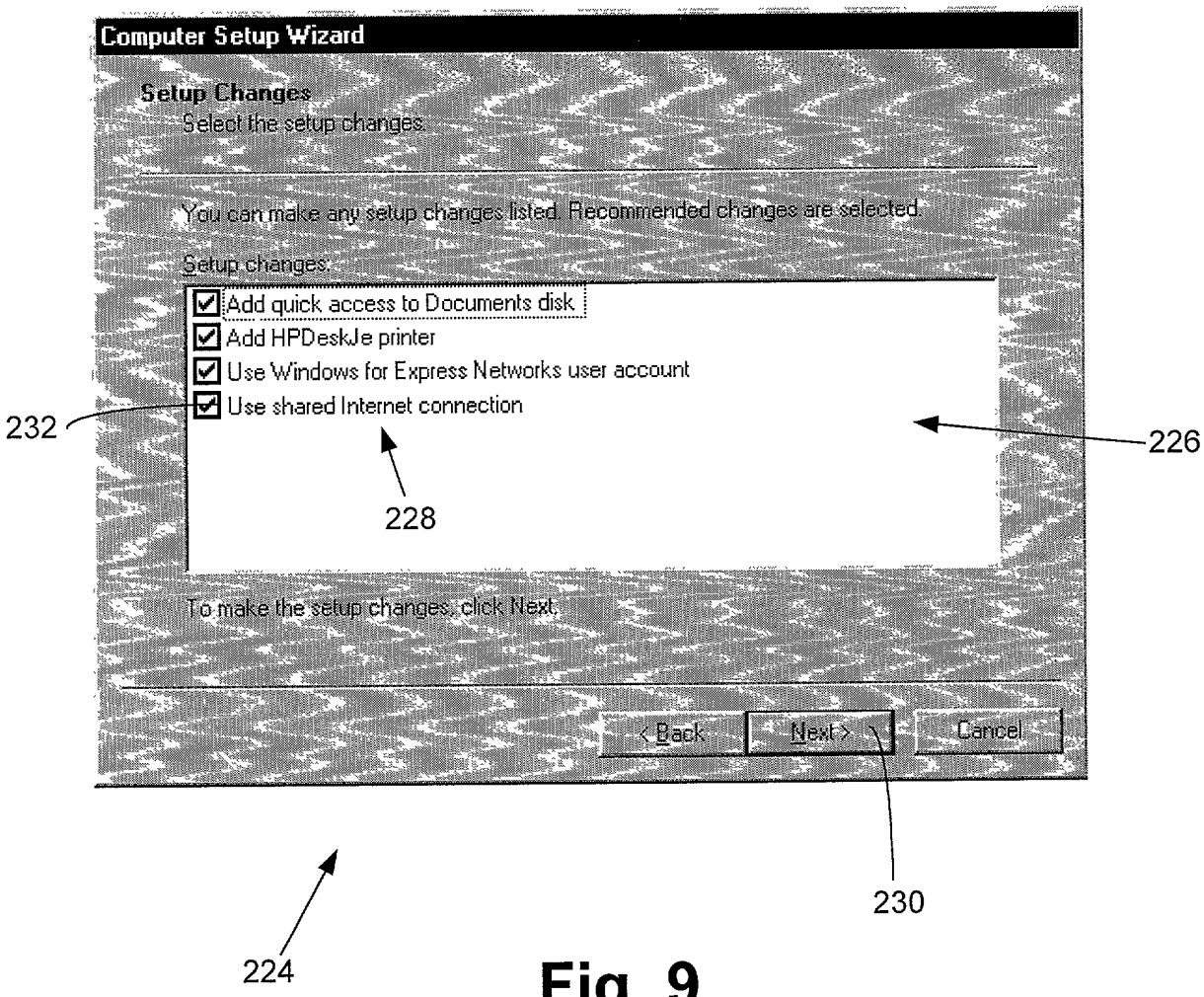
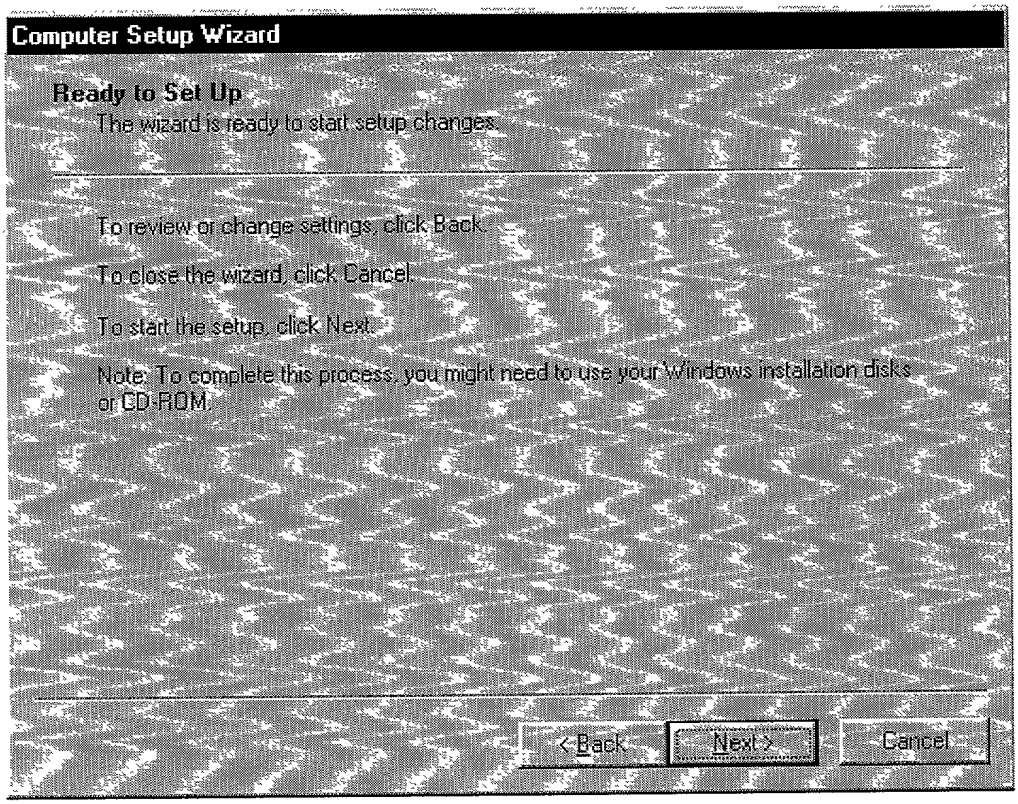
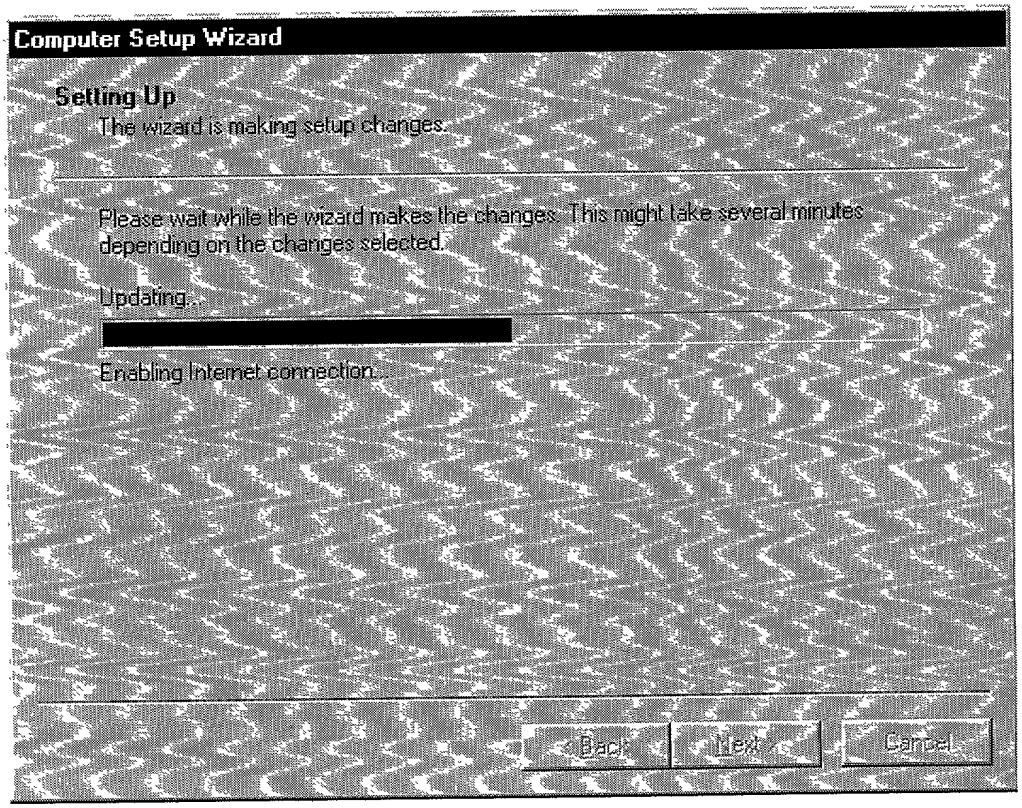

Computer Setup Wizard
Setup Changes
Select the setup changes.
You can make any setup changes listed. Recommended changes are selected.
Setup changes:
Add quick access to Documents disk
Add HPDeskJe printer
Use Windows for Express Networks user account
Use shared Internet connection
To make the setup changes, click Next.
< Back
Next >
Cancel
232
228
226
230
224

Fig. 9


Computer Setup Wizard
Ready to Set Up
The wizard is ready to start setup changes.
To review or change settings, click Back.
To close the wizard, click Cancel.
To start the setup, click Next.
Note: To complete this process, you might need to use your Windows installation disks or CD-ROM.
< Back
Next >
Cancel

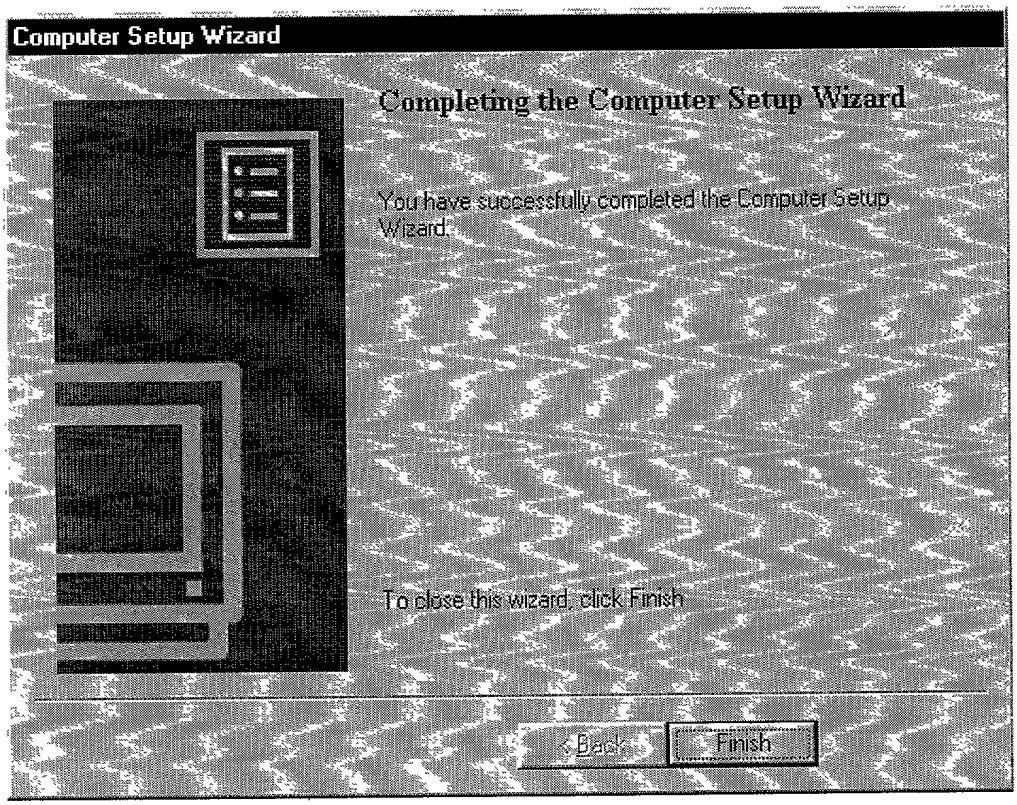
240

Fig. 10


Computer Setup Wizard
Setting Up
The wizard is making setup changes.
Please wait while the wizard makes the changes. This might take several minutes depending on the changes selected.
Updating...
Enabling Internet connection...
< Back
Next >
Cancel

242

Fig. 11


Computer Setup Wizard
Completing the Computer Setup Wizard
You have successfully completed the Computer Setup Wizard.
To close this wizard, click Finish.
< Back
Finish

244

Fig. 12

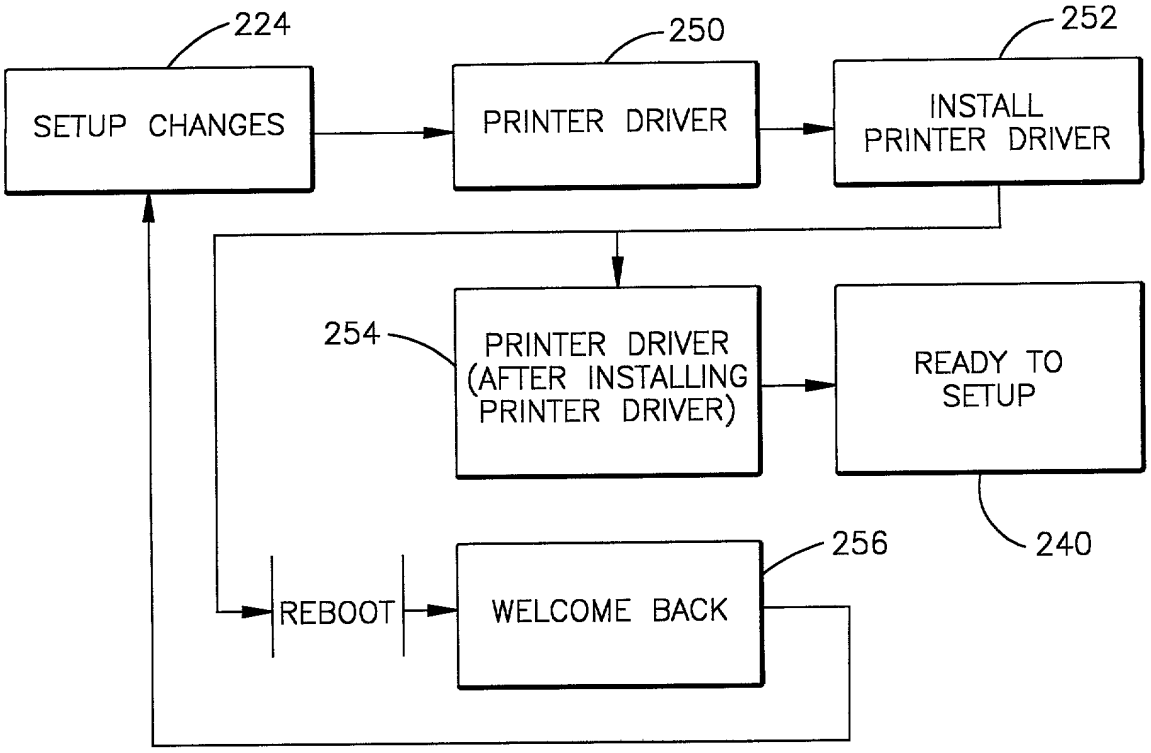


Fig.13

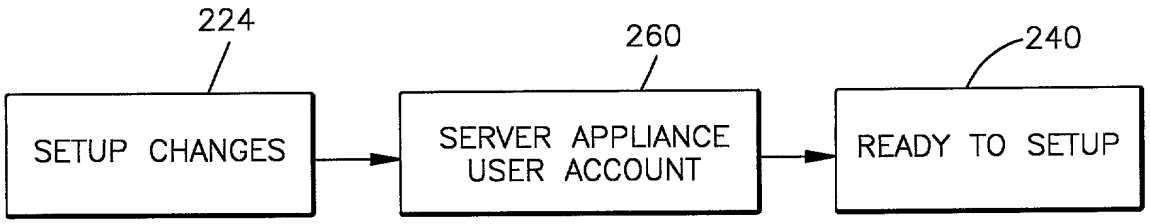


Fig.14

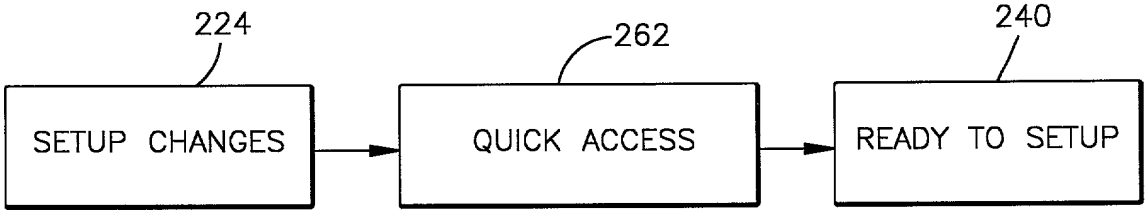


Fig.15

D0S5S6S7S8S9S2S6D6

Attorney's Docket No. 15-752 *Patent*

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Automatic Client Configuration

the specification of which:

___X___ is attached hereto.
_____ was filed on as United States Patent Application Number and was amended on ___ (if applicable).
_____ was filed on _ as PCT International Application Number ___ and was amended on _ (if applicable).

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56. Under that section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and (1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or (2) it refutes, or is inconsistent with, a position the applicant takes in: (i) opposing an argument of unpatentability relied on by the United States Patent and Trademark Office, or (ii) asserting an argument of patentability.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application(s) which designated at least one country other than the United States, listed below. I have also identified below any corresponding foreign application(s) for patent or inventor's certificate or any corresponding PCT international application(s) having a filing date before that of the application(s) on which priority is claimed.

Prior Foreign Application(s)

Number	Country	Filing Date (mm/dd/yyyy)	Priority Claimed (Yes or No)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

United States Provisional Application(s)

Application Number	Filing Date (mm/dd/yyyy)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or § 365(c) of any PCT international application(s) designating the United States, listed below. Insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application.

United States Application(s) Upon Which Priority is Claimed

Application Number	Filing Date (mm/dd/yyyy)	Status (abandoned, pending, patent number)

I hereby appoint the following attorney(s) and/or agent(s), all of whom are associated with Watts, Hoffmann, Fisher & Heinke Co., L.P.A., having offices at 1100 Superior Avenue East, Suite 1750, Cleveland, Ohio 44114-2518, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith:

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George L. Pinchak, Jr., Reg. No. 37,697
Linn J. Raney, Reg. No. 23,078
Paul A. Serbinowski, Reg. No. 34,429
Richard A. Sharpe, Reg. No. 34,722
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and the following attorney(s), all of whom are associated with Microsoft Corporation having an address of One Microsoft Way, Redmond, Washington 98052-6399;

Daniel D. Crouse, Reg. No. 32,022
Katie E. Sako, Reg. No. 32,628

to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and I hereby designate the foregoing Stephen J. Schultz, Reg. No. 29,108, principal attorney.

This appointment shall include all power to prosecute and transact all business relating to all applications corresponding to this application in all countries, including all regional and international patent offices, such as, but not limited to, the European Patent Office and all offices and bureaus established in accordance with the Patent Cooperation Treaty.

I hereby further designate and appoint any officer of Watts, Hoffmann, Fisher & Heinke Co., L.P.A. my attorney in fact with full power of substitution and revocation, including power to designate a substitute principal attorney.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

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Residence: Redmond, Washington	Citizenship: India
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